



NAVEENA CRASTA

Curriculum vitae

Research interests

- Nonlinear control systems
- Rigid-body dynamics
- Observability Analysis
- Estimation theory
- Autonomous Underwater vehicles
- Optimal control and optimization

Education

- 2004 – 2009 **Doctor of Philosophy**, *Indian Institute of Technology Bombay*, Mumbai, India, 8.00 (on the scale of 10.00).
Specialization: Dynamics and Control
- 2002 – 2004 **Master of Technology**, *Indian Institute of Technology Delhi*, Delhi, India, 7.52 (on the scale of 10.00).
Specialization: Control and Automation
- 1996 – 2000 **Bachelor of Engineering**, *Manipal Institute of Technology*, Manipal, India, 72 % (First class with distinction).
Specialization: Electrical and Electronics Engineering

PhD thesis

- title *Observability of nonlinear input-affine systems with application to attitude dynamics*
- supervisors Dr. Sanjay P Bhat and Dr. Ashok Joshi
- description The main objective of this thesis is to characterize sets of indistinguishable states of a general, smooth, nonlinear input-affine system. To illustrate the utility of our results, we show how our results can be used to deduce observability properties of the full attitude dynamics of an inertially symmetric rigid body under different actuator-sensor configurations from the observability properties of the reduced attitude dynamics of an unactuated, inertially symmetric rigid body equipped with a single attitude sensor. Characterization of sets of indistinguishable states of the full attitude dynamics require the angular rotations required about each axis of a given specific set of three axes such that the composition of rotations about these three axes produce no net rotational displacement and hence we provide explicit analytical solutions to this problem.

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Experience

Research

- 2014 – present **Postdoctoral Fellow**, *Institute for Systems and Robotics*, Lisbon, Portugal.
Funding: EU-FP 7 (ICT)
Project: "Marine Robotic System of Self-organizing, Logically Linked Physical Nodes (MORPH)"
Supervisor: Prof. Antonio M. Pascoal
Detailed achievements:
 - Investigation of observability analysis of 3D trimming trajectories for single beacon navigation
 - Exploration of optimal trajectories that maximize range-related information for localization
- 2012 – 2014 **Researcher**, *Technische Universität Ilmenau*, Ilmenau, Germany.
Funding: EU-FP 7 (ICT)
Project: "Marine Robotic System of Self-organizing, Logically Linked Physical Nodes (MORPH)"
Supervisor: Prof. Christoph Ament
Detailed achievements:
 - To develop an obstacle avoidance algorithm for underwater vehicle in a dynamic environment
- 2010 – 2012 **Postdoctoral Fellow**, *Supelec*, Gif-Sur-Yvette, France.
Funding: EU-FP 7 (ICT)
Project: "EUCLID"
Supervisor: Prof. Françoise Lamnabhi L.
Detailed achievements:
 - Developed a hybrid observer for a class of nonlinear systems
 - Investigated the Kinetic Energy Partial Differential Equations arising from the energy based controller design
- 2009 – 2010 **Postdoctoral Fellow**, *Institute for Systems and Robotics*, Lisbon, Portugal.
Funding: FCT, Portugal
Project: "DEvelopment of Nonlinear Observers (DENO)"
Supervisor: Prof. Antonio Pedro Aguir
Detailed achievements:
 - Investigated the observability of 2D single-beacon navigation
- 2009 – 2009 **Research Fellow**, *Institute for Systems and Robotics*, Lisbon, Portugal.
Funding: FCT, Portugal
Project: "DEvelopment of Nonlinear Observers (DENO)"
Supervisors: Prof. Antonio Pedro Aguir and Prof. Fatima Leite
Detailed achievements:
 - Developed an observer for estimating the orientation and the position of a rigid-body by using the images of a set of fixed points

Teaching

- 2000 – 2001 **Assistant Lecturer**, *National Institute of Technology Karnataka*, Suratkal, India.
2001 – 2002 **Lecturer**, *NMAMIT Karnataka*, India.


Application areas

- Guidance, Navigation and Control of underwater vehicles
- Mechanical systems
- Motion planning and optimization
- Single-beacon navigation

Computer skills

Programming Matlab, Scilab, Mathematica, Maple, Octave, GeoGebra, Python (Basic knowledge)

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Modeling OpenModelica
Others LaTeX, BibTex, Gnuplot, Microsoft office, WordPress
Operating Microsoft Windows, Linux
systems

Awards

- All India Rank of 127 in Graduate Aptitude Test in Engineering (GATE -2002)
- Received Teaching Assistantship from the Govt. of India for the PhD (2004-2008)

Languages

Konkani	Read/write	<i>Mother tongue</i>
Tulu	Read/write	
Kannada	Read/write	
Hindi	Read/write	
English	Read/write	

Interests

hobby 1 Playing volleyball
hobby 2 Vedic mathematics
hobby 3 Reading books

Place: Lisbon

Date: September 19, 2014

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